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ECE-357 Operating System: Problem Set #3

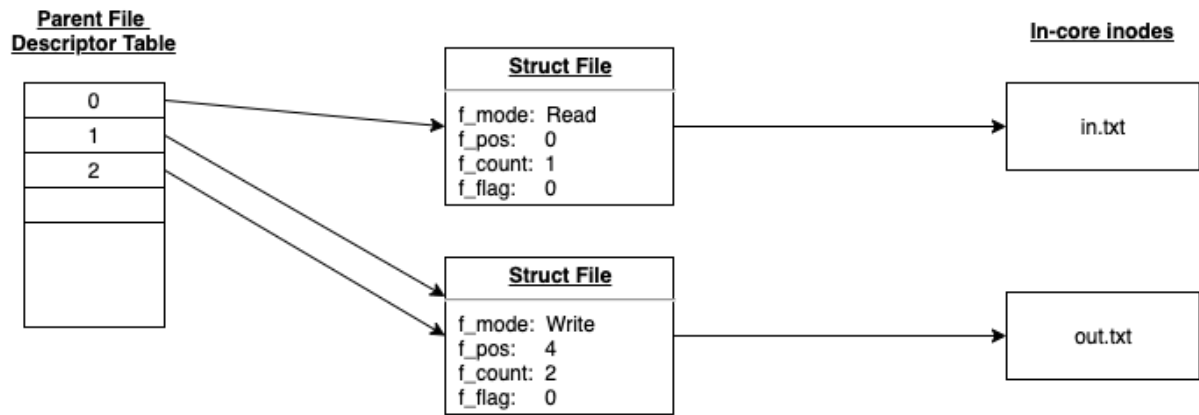
1a) Data, the keyword static in the C programming language treats the variable i like a global variable. Also, it is initialized to 10. The data region contains global initialized variables.

1b) The program will first start by running f1() on line 4, then will proceed to fork(). Then there will be a child process as well as the parent. For parent, fork() does not equal to 0 and therefore will not go into the logic statement, and will proceed to the last f1() outside the loop. The child one on the other hand, will have fork() == 0, and will run the statement within the logic statement and the f1() proceeding it, hence producing 4 outputs.

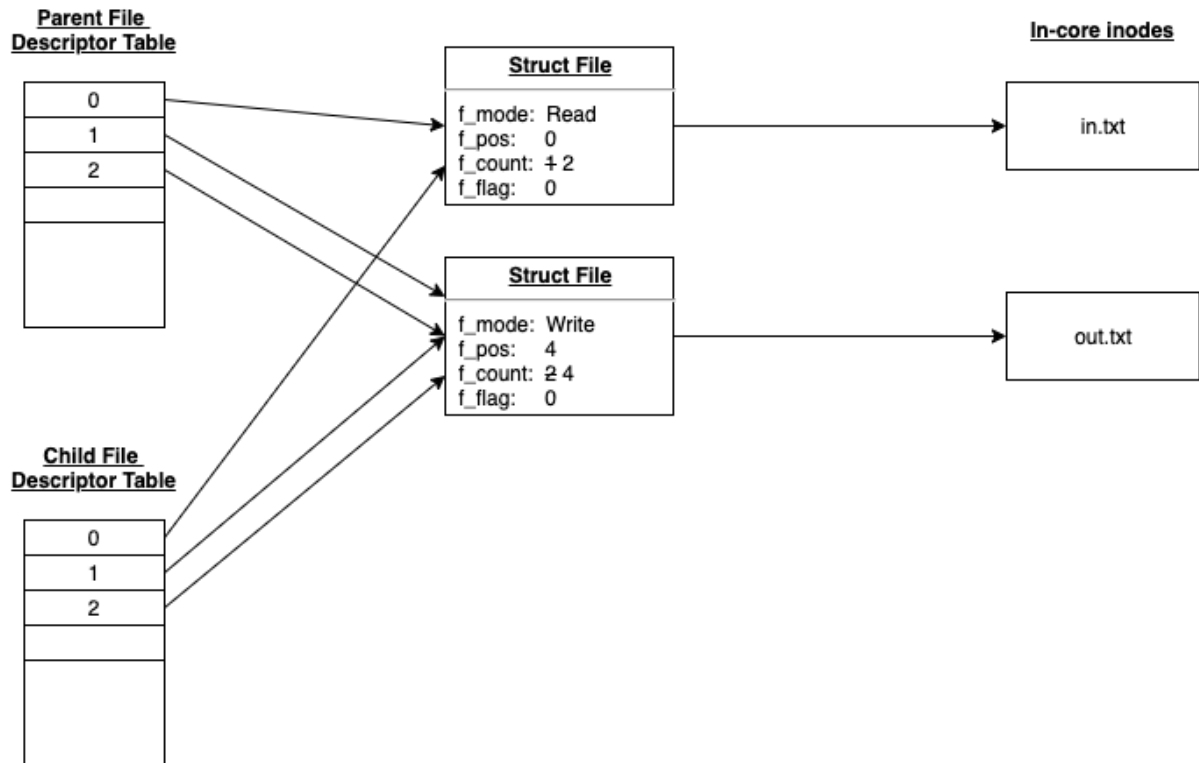
1c) The output is not predetermined. The only thing that we are sure of is that the first f1 call in the parent function is called. However, everything after that is not determined. There is a possibility that the codes run simultaneously.

1d) The wait function in the parent process will return the child process in 8 most significant bits and the signal number in the least 8 significant bits. So for the child process, ws did not change and $(-1 \gg 8) \& 255$ will be equal to 255. Since the program is exited normally, signal number = 0, so the ws is now 65280, and $(65280 \gg 8) \& 255$ becomes 255.

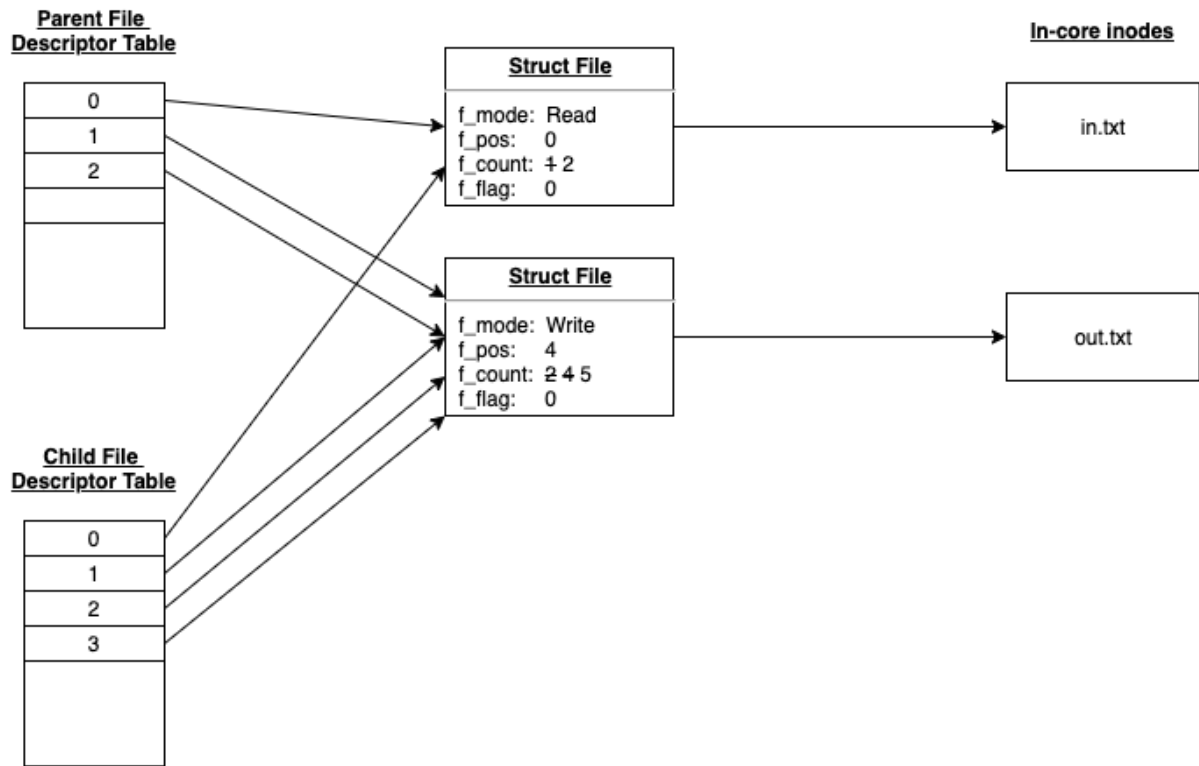
write(1, "1234", 4)



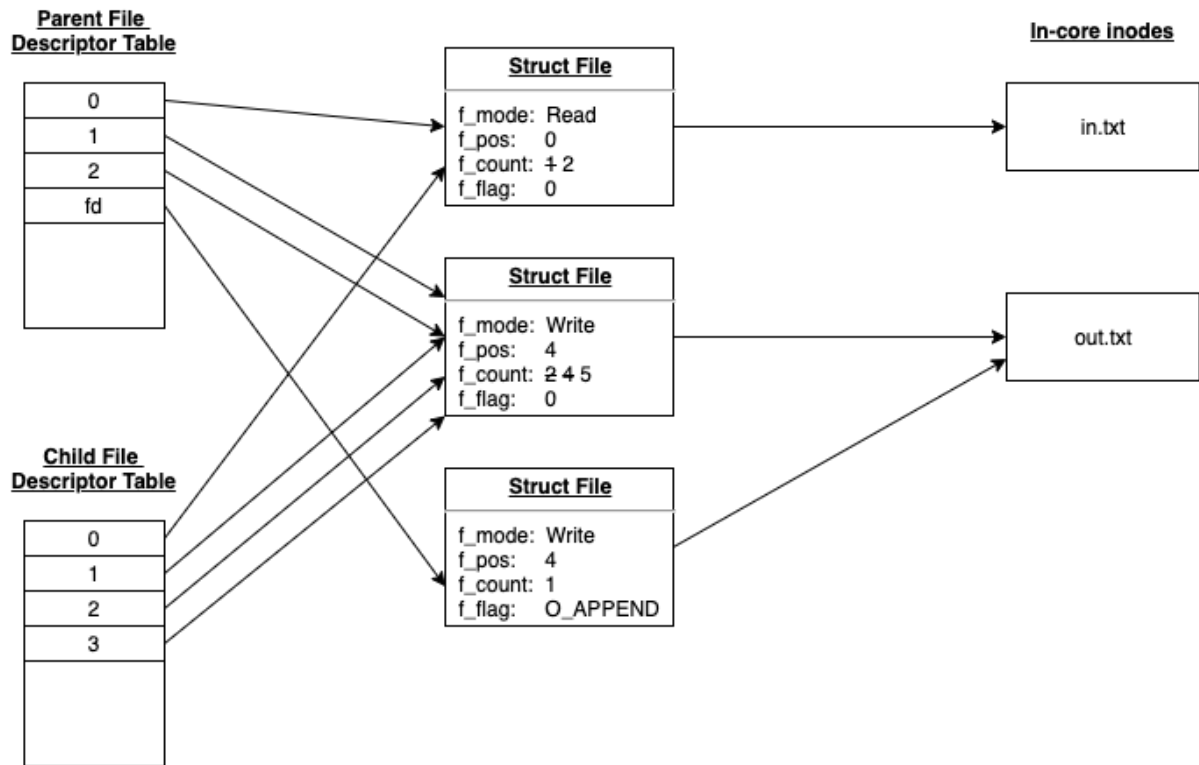
pid = fork()



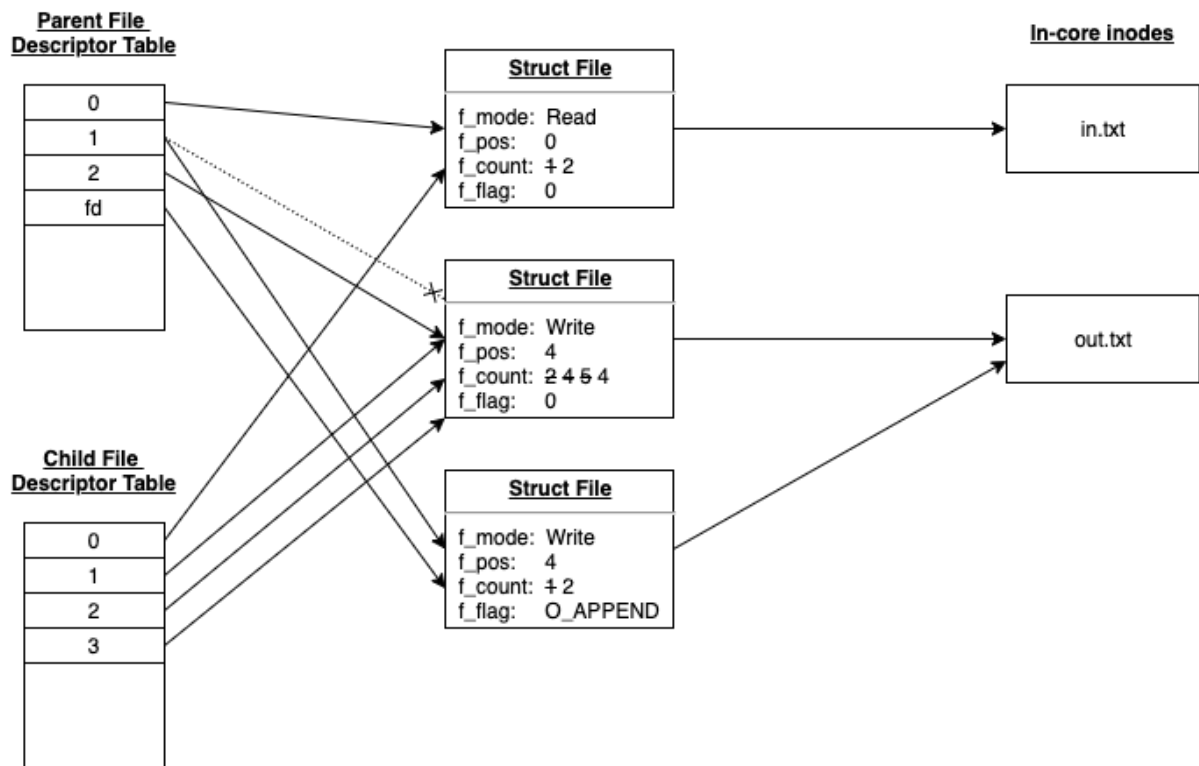
dup2(2,3)



fd = open("out.txt",O_WRONLY|O_APPEND)



dup2(fd, 1)



write(1, "ABC", 3)

